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NAVFAC **IGS-08710 (MAY 2002)**

Preparing Activity: LANTNAVFACENGCOM **Based on UFGS-08710N**

ITALIAN GUIDE SPECIFICATIONS

Use for ITALIAN projects only

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SECTION 08710

DOOR HARDWARE

05/02

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NOTE: This guide specification is issued by the Atlantic Division, Naval Facilities Engineering Command for regional use in Italy.

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NOTE: This guide specification covers the requirements for finish hardware for permanent structures. All items of finish hardware necessary for completion of the project and not specified in other sections should be included in this section.

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NOTE: On the drawings, show:

1. Location, class, and hourly rating of fire doors;

2. Location and installation details for blocking behind door stops (wall bumpers) mounted on wallboard partitions; and

3. Either hardware set numbers (HW-2, etc.) in the door schedule, or list doors by number in each hardware set.

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Comments and suggestion on this specification are welcome and should be directed to the technical proponent of the specification. A listing of the technical proponents, including their organization designation and telephone number, is on the Internet.

Use of electronic communication is encouraged.

Brackets are used in the text to indicate designer choices or locations where text must be supplied by the designer.

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PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION (ISO)

ISO 6603-2	(1985) Plastics - Determination of Multiaxial Impact Behaviour of Rigid Plastics

ITALIAN LAWS AND NORMS

D.M. 26.6.84	(1984) Fire Resistance Classification and Ratification for Fire Prevention
D.M. 14/12	(1993) Technical Norms and Procedures for the Classification of Fire Resistance and Ratification of Doors and Other Closure
Circ. n. 91	(1961) Fire Resistance of Doors

ITALIAN NATIONAL ASSOCIATION FOR UNIFICATION OF STANDARDS (UNI)

UNI EN 485/3	(1993) Aluminum and Aluminum Alloys-Sheet Strip and Plate-Part 3: Tolerances on Shape and Dimensions for Hot Rolled Products
UNI 9171	(1988) Residential Building - Locks - Terminology and Dimensional Symbols
UNI 9172	(1988) Building - Locks - Requirements and Check List
UNI 9570	(1989) Cylinder Locks - Characteristics, Classification and Tests
UNI 9723	(1990) Fire Resistance of Doors and Locking Devices - Test Methods and Classification Criteria

EUROPEAN COMMITTEE FOR STANDARDIZATION (CEN)

EN 179	(1997) Building Hardware - Emergency Exit Devices Operated by a Lever Handle or Push Pad - Requirements and Test Methods

EN 1125	(1997) Building Hardware - Panic Exit Devices Operated by a Horizontal Bar - Requirements and Test Methods
EN 1154	(1996) Building Hardware - Controlled Door Closing Devices - Requirements and Test Methods
EN 1158	(1997) Building Hardware - Door Coordinator Devices - Requirements and Test Methods
EN 1303	(1998) Building Hardware - Cylinders for Locks - Requirements and Test Methods
EN 1670	(1998) Building Hardware - Corrosion Resistance - Requirements and Test Methods
EN 10051	(1991) Continuously Hot Rolled Plate, Sheet and Strip of Non Alloy and Alloy Steels - Tolerances on Dimensions and Shape
PR EN 1906	(1995) Building Hardware - Lever Handles and Knobs - Requirements and Test Methods
PR EN 1935	(1995) Building Hardware - Single Axis Hinges - Requirements and Test Methods
EN 10088/1	(1995) Stainless Steels - Part 1: List of Stainless Steels
EN ISO 6509	(1995) Corrosion of Metals and Alloys - Determination of Dezincification Resistance of Brass (ISO 6509-81)
PR EN 12051	(1995) Building Hardware - Door and Window Bolts - Requirements and Test Methods
PR EN 12209-1	(1995) Building Hardware - Locks and Latches - Part 1: Mechanically Operated Locks and Latches - Requirements and Test Methods
PR EN 12209-2	(1995) Building Hardware - Locks and Latches - Part 2: Striking Plates for Mechanically Operated Locks and Latches - Requirements and Test Methods
PR EN 12320	(1996) Building Hardware - Padlock and Padlocks Fittings - Requirements and Test Methods
PR EN 12365-1	(1996) Building Hardware - Gasket and Weatherstripping for Doors, Windows,

1.2 SUBMITTALS

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NOTE: Submittals must be limited to those necessary for adequate quality control. The importance of an item in the project should be one of the primary factors in determining if a submittal for the item is required.

A "G" following a submittal item indicates that the submittal requires Government approval. Some submittals are already marked with a "G". Only delete an existing "G" if the submittal item is not complex and can be reviewed through the Contractor's Quality Control system. Only add a "G" if the submittal is sufficiently important or complex in context of the project.

For submittals requiring Government approval on Army projects, a code of up to three characters within the submittal tags may be used following the "G" designation to indicate the approving authority. Recommended codes for Army projects are "RE" for Resident Engineer approval, "ED" for Engineering approval, and "AE" for Architect-Engineer approval. Codes following the "G" typically are not used for Navy projects.

Submittal items not designated with a "G" are considered as being for information only for Army projects and for Contractor Quality Control approval for Navy projects.

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Submit the following in accordance with Section 01330, "Submittal Procedures."

SD-02 Shop Drawings

Hardware Schedule; G

Submit electrical wiring diagrams for all automatic door products, closers, strikes and lock sets that require electrical power.

SD-03 Product Data

Hardware items; G

Keying System

Key Bitting

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NOTE: For special hardware items requiring shop drawings, add submittal requirement for [SD-02 Shop Drawings]. Do not require shop drawings for standard commercial hardware.

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SD-08 Manufacturer's Instructions

Installation

SD-10 Operation and Maintenance Data

Hardware Schedule items, Data Package 1; G

Submit data package in accordance with Section 01781, "Operation and Maintenance Data."

1.2.1 Hardware Schedule

Prepare and submit hardware schedule in the following form:

Hardware Item	Quantity	Size	Reference Publication Type No.	Finish	Mfr. Name and Catalog No.	Key Control Symbols	UL Mark (If fire rated and listed)	ANSI/BHMA Finish Designation

1.2.2 Key Bitting Chart Requirements

Submit Key bitting charts to the Contracting Officer prior to completion of the work. Include:

a. Complete listing of all keys (AA1, AA2, ETC.).

b. Complete listing of all key cuts (AA1-123456, AA2-123458).

c. Tabulation showing which key fits which door.

d. Copy of floor plan showing doors and door numbers.

e. Listing of 20 percent more key cuts than are presently required in each master system.

1.2.2.1 Wiring Diagrams

Detail wiring for power, signal, and control systems and differentiate between manufacturer installed and field installed wiring. Include the following:

a. System schematic

b. Point-to-point wiring diagram

c. Riser diagram

d. Elevation of each door

1.2.2.2 Description

Submit a written description of the functional use of all of the electrical/electronic hardware.

a. Include a riser diagram which shows number and size of all conductors, each item of electrical / electronic hardware, and its location.

b. Include the point-to-point wiring to show termination of all conductors.

c. Detail interface between electrified door hardware and [fire alarm], [access control], [security], and [building control] system.

1.3 QUALITY ASSURANCE

1.3.1 Coordination

The Contractor shall coordinate keying system requirements with the Officer in Charge of Construction (OCC) and the Activity Locksmith.

1.3.2 Hardware Manufacturers and Modifications

Provide, as far as feasible, locks, hinges, [pivots,] and closers of one lock, hinge, [pivot,] or closer manufacturer's make. Modify hardware as necessary to provide features indicated or specified.

1.3.2.1 Fire Rated Door Assemblies

For rated door assemblies, all components to include the door, frame and the hardware assembly shall be certified and rated to have been tested by a testing laboratory, as approved by the Contracting Officer, and in accordance with UNI 9723, Circ. n. 91 and D.M. 14/12.

1.4 DELIVERY, STORAGE, AND HANDLING

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NOTE: Whenever construction master keying is required, permanent keys (and removable cores) should be sent directly to the Contracting Officer.

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Deliver hardware in original individual containers, complete with necessary appurtenances including fasteners and instructions. Mark each individual container with item number as shown in hardware schedule. [Deliver permanent keys [and removable cores] to the Contracting Officer, either

directly or by certified mail. Deliver construction master keys with the locks.]

PART 2 PRODUCTS

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NOTE: In Italy and in Europe Door Hardware Associations such as ANSI/BHMA that formulate specific test method descriptions that cover the U.S. door hardware and accessories production market do not exist. In Italy and also in all of Europe ANSI/BHMA Standards are not accepted. The Italian Door Hardware manufacturers recognized around Europe design their products in accordance with Italian laws, UNI standards and with the European Committee for Standardization CEN Norms. Most High Quality door hardware manufacturers in Italy are associated with UCI, "Unione Costruttori Chiusure Tecniche", (Construction Union Technical Closures) P.O. Box n. 583, 38100 Trento, Italy, Tel. 0461/811418. This Association provides Quality Certification to Door Hardware components and lists the recognized UNI and EN standards of strategic value in order to control quality. Since all Door Hardware manufactured products in Europe are different from each other, a general schedule for typical Standard Hardware is not available. Door Hardware technical specifications for projects in Italy and Europe should include all the applicable local laws, UNI, EN and ISO standards specified, described and referred to Door Hardware components.

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NOTE: For hardware which are required to be components of a tested assembly, specify hardware products which have been tested as an approved assembly, by an Independent Testing Laboratory, acceptable to the Contracting Officer. Verify with the hardware product manufacturer that the door and frame manufacturers have documented proof of the hardware compatibility with their products to meet the required rating requirements from an independent testing laboratory, approved by the Contracting Officer.

In some instances, it will be required to match the existing hardware to include the existing masterkeying system. In the event that the existing hardware is of U.S. manufacture, compliance must be with the U.S. standards.

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2.1 MANUFACTURERS

The following manufacturers make products which comply with these specifications:

a. AGB, Alban Giacomo, S.p.A.
Via A. De Gasperi, 75
36060 Romano d'Ezzelino (VI)
Tel. 0424/832832
Fax 0424/832900
Internet: http://www.agb.it

b. BEST LOCK SECURITY SYSTEM
Postfach 93
1790 Landstuhl, Germany
Tel. 0049.6371.13379
Fax 0049.6371.6338

c. CISA S.p.A.
Via Oberdan 42
48018 Faenza (RA)
Tel. 0546.677111
Fax 0546.677150

d. CORBIN Co.
P.O. Box 79
40017 S. Giovanni in Persiceto (BO)
Tel. 051/6812411
Fax 051/827486
E-mail: corbin@corbin.it

e. MAICO S.r.l.
Zona Artigianale 15
39015 S. Leonardo in Passiria (BZ)
Tel. 0473/651200
Fax 0473/651300
E-mail: maico@maico.com

f. INGERSOLL-RAND
Controls for Doors Ltd.
(Mr. Ron Venn)
Hurst Place
Woldingham, Surrey
United Kingdom CR3 7LT
Tel. 44 1 883 652 652
Fax 44 1 883 652 055

g. YALE S.p.A.
Via dei Rutuli, 74/76
04011 Aprilia (LT)
Tel. 06/928941
Fax 06/92894580

2.1 TEMPLATE HARDWARE

Hardware to be applied to metal [or to prefinished doors] shall be made to template. Promptly furnish template information or templates to door and frame manufacturers after completion of an approved hardware schedule as specified in submittal requirements. Standard for template hinge dimensions shall be recommended by door and hardware manufacturer. Coordinate hardware items to prevent interference with other hardware.

2.2 HARDWARE FOR FIRE DOORS AND EXIT DOORS

Provide all hardware necessary to meet the requirements for fire doors and for exit doors, as well as to other requirements specified, even if such hardware is not specifically mentioned under paragraph entitled "Hardware Schedule." [Swinging hardware for tin-clad fire doors shall conform to UNI 9723.] The hardware manufacturer shall have provided documented proof of the hardware compatibility with assembly rating from an independent testing laboratory approved by the Contracting Officer, prior to commencement of work activities.

2.4 HARDWARE ITEMS

Provide, as far as practicable, locks of one lock manufacturer's make,and door-closing devices of one door closing device manufacturer's make. Modifications to hardware that are necessary to conform to construction shown or specified shall be provided as required for the specified operative and functional features. Hinges shall be provided by door manufacturer.

Hinges, [pivots,] locks, latches, exit devices, bolts, and closers shall be clearly and permanently marked with the manufacturer's name or trademark where it will be visible after the item is installed. For closers with covers, the name or trademark may be beneath the cover.

2.4.1 Hinges

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NOTE: Coordinate hinge materials with "finishes" paragraph.

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Hinges shall be provided by the door and frame manufacturer in accordance with PR EN 1935 and UNI 9723. Fire rated doors shall have fire rated hinges. Construct loose pin hinges for exterior doors and reverse-bevel interior doors so that pins will be nonremovable when door is closed. Nylon or oil impregnated bearing hinges may be provided in lieu of ball-bearing hinges, except for labeled fire doors. Hinges shall bear name or trademark of manufacturer. Provide types of hinges, sizes, finish, design options, and quantity per door for specified openings as specified herein under paragraph entitled "Hardware Sets". Hinges shall be full mortise. Provide hinge base material of [steel] [galvanized steel] [carbon steel] [brass or bronze, unless located in rated openings requiring steel]. Provide exterior door hinges in [stainless steel] [galvanized steel] [brass or bronze].

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NOTE: Use full-mortise (butt) hinges except where special types are required. Use swing-clear hinges where necessary to keep door opening completely clear when door is opened 90 to 95 degrees. Use wide-throw hinges where necessary to keep door leaf clear of wall, casings, jambs, or reveals. Use antifriction-bearing hinges on high-frequency or extra-heavy doors, and on doors equipped with closers. Use plain-bearing hinges on low-frequency doors up to 900 mm wide and without closers. Use hospital tips in neuropsychiatric areas of medical facilities. In general, full-mortise hinges for interior doors should be steel with (primed for painting) finish. Hinges on natural wood or plastic surfaced interior doors should be steel with satin chromium plated over nickel finish or satin bronze plated, clear-coated finish (satin bronze plated) to match finish of other door hardware. Hinges for exterior doors should be stainless steel with satin stainless steel finish or solid brass or bronze with satin chromium plated over nickel finish. Plated steel hinges may rust if used on exterior doors. Use two hinges for doors [1500 mm] or less in height and one additional hinge for each additional 750 mm of door height.

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2.4.1.1 Hinge Size

Butts and hinges heavy duty, wrought steel, solid brass, or stainless steel, as scheduled, 3.50 mm thick minimum, with four screw holes per leaf.

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NOTE: Hinge size description shall include and consider the following data:

1. Select and size hinges for lead-lined, unusually heavy, and high-frequency doors on an individual basis.

2. The 100 by 100 mm listed is for 44 mm doors up to 900 mm wide and with up to 20 mm trim projection, and covers the majority of openings. For other doors, determine hinge width in accordance with:

Twice the door thickness plus trim projection, minus 13 mm. If answer falls between regular hinge sizes, use nearest larger size. Formula is for hinges set back 6 mm from edge of door.

Provide hinge heights in accordance with the following chart:

Hinge Sizes Chart

Thickness of Doors in mm	Width of Doors in mm	Height of Hinge (Length Joint in mm
40	To 900	75
40	To 900	100
65	To 900	100
80	To 900	120
80	To 1000	120
85	Over 1000	120
80	To 1200	140
80	Over 1200	140

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[2.4.2 Pivots

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NOTE: For extra heavy doors, pivots are sometimes preferable to hinges, particularly on entrance doors and lead-lined doors. See PR EN 1935 and manufacturers' literature for types available.
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Single axis type pivots for entrance doors shall be in accordance with PR EN 1935.]

2.4.3 Locks and Latches

PR EN 12209-1.

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NOTE: Specify "mortise type", in paragraph entitled "Mortise Locks and Latches," for hollow metal doors where security is a major factor. See UNI 9171 for Residential Buildings and EN 12209-1 and EN 1303 for guidance on Security Grades.

For Bachelor Enlisted Quarters (BEQ) sleeping room doors, use heavy-duty pushbutton combination locks in accordance with PR EN 1906 with keyed cylinder bypass, with removable-core cylinders (mortise type lock); or a deadbolt, with interchangeable core and a latchset. Check with activity housing managers to determine preference in accordance with UNI 9570.

For doors between sleeping room and shared bath, use a privacy lock, and a deadlock, (key x thumbturn) keyed like the sleeping room entrance door and with

the key on the bathroom side.

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2.4.4 Mortise Locks and Latches

PR EN 12209-1. [Provide factory-installed lead lining in locks for lead-shielded doors.] [Provide mortise locks with escutcheons not less than 178 by 57 mm with a bushing at least 6 mm long. Cut escutcheons to suit cylinders and provide trim items with straight, beveled, or smoothly rounded sides, corners, and edges.] Latch action durability shall be Grade 3. Knobs and roses of mortise locks shall have screwless shanks and no exposed screws.

2.4.4.1 Residential Mortise Locks and Latches

UNI 9171 for Residential Hardware and standard office use. [Provide factory-installed lead lining in locks for lead-shielded doors.] [Provide mortise locks with escutcheons not less than 178 by 57 mm with a bushing at least 6 mm long. Cut escutcheons to suit cylinders and provide trim items with straight, beveled, or smoothly rounded sides, corners, and edges.] Knobs and roses of mortise locks shall have screwless shanks and no exposed screws.

2.4.4.2 Mortise Lockset Function Description

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NOTE: Mortise lockset function described herein defines requirements for project lockset. Choose the applicable paragraph(s) from the following.

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a. ENTRANCE/EXIT LOCK (Function F20): Latchbolt operated by handle from either side except when outside handle is locked when deadbolt is extended. Deadbolt by key outside and turn knob inside. When deadbolt is extended, turning inside knob handle retracts both latchbolt and deadbolt simultaneously, and unlocks outside handle.

b. OFFICE LOCK (Function F04): Latchbolt operated by handle from either side except when outside handle is locked by button in faceplate; latch is retracted by key outside. Auxiliary latch deadlocks latchbolt.

c. STOREROOM LOCK (Function F07): Latchbolt operated by handle inside and key outside. Outside handle always rigid. Auxiliary latch deadlocks latch bolt.

d. PASSAGE LOCK (Function F01): Latchbolt operated by handle from either side at all times.

e. CLASSROOM LOCK (Function F05): Latchbolt operated by lever or knob from either side except when outside lever or knob is locked from outside by key. When outside lever or knob is locked, latchbolt is retracted by key from outside or by operating inside lever or

knob. Auxiliary dead latch.

f. PRIVACY LOCK (Function F22): Latchbolt operated by lever or knob from either side. Deadbolt operated by turn from inside and by emergency release from outside.

g. APARTMENT CORRIDOR LOCK (Function F13): Latchbolt operated by lever or knob from either side, except when outside lever or knob is made inoperative by a stop or mechanical means other than key. Deadbolt operated by key outside or turn inside. Key outside operates both bolts. Operating inside lever or knob retracts both bolts. Latchbolt is deadlocked when outside lever or knob is made inoperative or when the deadbolt is projected. When deadbolt is retracted, lever or knob is unlocked by stop or mechanical means other than key.

h. COMMUNICATING LOCK (Function F03): Latchbolt operated by lever or knob from either side. Two deadbolts or split deadbolt operated independently by turns on from both sides. Not to be used on doors in rooms that have no other entrance.

i. RESIDENTIAL OR APARTMENT ENTRANCE (Function F09): Latchbolt operated by lever or knob from either side, except when outside lever or knob is locked by key from inside when outside lever or knob is locked, latchbolt is retracted by key from outside or by operating inside lever or knob. Auxiliary deadlatch.

2.4.4.3 Bored Locks and Latches

PR EN 12209-1. [Provide factory-installed lead lining in locks for lead-shielded doors.]

2.4.4.3 Bored-Type Lock Functions Description

a. ENTRY LOCK (Function F82): Deadlocking latchbolt operated by knob from either side except when outside knob is locked by push button or other locking device on inside. When outside knob is locked, operating key in outside knob or rotating inside knob unlocks push button or other locking device and retracts latchbolt. Closing door does not release push button or other locking device.

b. COMMUNICATING LOCK (Function F78): Deadlocking latchbolt operated by knob from either side. Turn button in either knob or locking device on either side locks or unlocks opposite knob. Should not be used on doors in rooms that have no other entrance.

c. PRIVACY, BEDROOM OR BATH LOCK (Function F76): Latchbolt operated by knob from either side. Outside knob is locked by push button or other locking device inside and unlocked by emergency release outside, rotating inside knob or closing door.

d. PASSAGE OR CLOSET LATCH (Function F75): Latchbolt operated by knob from either side at all times.

e. CORRIDOR LOCK (Function F90): Deadlocking latchbolt operated by knob from either side except when outside knob is locked by key in outside knob or by push button or other locking device in inside. Key in outside knob locks or unlocks outside knob. Rotating inside knob releases push button or other locking device placed in a locked position. Closing door releases push button or other inside locking device. Inside knob always operates.

f. STORE ROOM OR CLOSET LOCK (Function F86): Deadlocking latchbolt operated by key in outside knob or by rotating inside knob. Outside knob is always fixed.

g. CLASSROOM LOCK (Function F84): Deadlocking latchbolt operated by knob from either side except when outside knob is locked from outside by key. When outside knob is locked, latchbolt is operated by key in outside knob or by rotating inside knob.

2.4.4.5 Residential Bored Locks and Latches

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NOTE: For temporary buildings and family housing only. Delete if not applicable. See standard for bored and preassembled latches in accordance with UNI 9172 for types available.
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Standard for bored and preassembled latches in accordance with PR EN 12209-1. Locks for exterior doors shall have threaded roses or concealed machine screws.

2.4.4.6 Hospital Latches

Push-pull latchset shall be in accordance with UNI 9171, UNI 9172 and EN 1154 throw, [70 mm] [127 mm] backset. Cover approximately 64 by 140 mm, handle approximately 38 by 114 mm,, projection approximately 64 mm, covers and handles of stainless steel, (satin stainless steel) finish, engraved "PUSH" and "PULL" on handles, push handle pointing up, pull handle pointing down.

2.4.4.7 Auxiliary Locks

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NOTE: Delete if not applicable. See standard for auxiliary locks for types available. Verify auxiliary locks with manufacturer.
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2.4.4.8 Mortise Deadlock, Narrow Backset Types for Swinging Doors

a. Function F16 - Deadlock: For single-swinging doors. Key on both sides projects or retracts pivoted or conventional deadlocking bolt. Front may be flat, radiused, beveled or radiused with integral weather-seal.

b. Function F17 - Deadlock: For single-swinging doors. Key on

outside, turn knob on inside projects or retracts bolt.

c. Function F17C - Deadlock: For single swinging doors. Key on outside, turn knob on inside will retract deadbolt, but will not project deadbolt.

2.4.4.9 Mortise Deadbolt and Deadbolt Locks Types for Sliding Doors

a. Function E0281 or E8281 - Deadlock: For sliding doors. Key on both sides projects or retracts pivoted hook-type deadlocking bolt.

b. Function E0291 or E8291 - Hook type latchbolt operated by key from outside and by handle from inside. At manufacturers option, flush handles may be provided, in which case key from outside locks or unlocks outside handle, with inside handle always free.

2.4.4.10 Auxiliary Rim Locks

a. Function E06212: Latchbolt by key from outside and by turn from inside. Latchbolt may be held retracted by device from inside. Regular bevel strike standard. Reverse bevel strike furnished when specified.

b. Function E06222: Deadbolt by key from outside and by turn from inside. Regular bevel strike standard. Reverse bevel strike furnished when specified.

c. Function E06261: Interlocking deadbolt operated by key from either side. Specify regular or reverse bevel strike.

d. Function E06271: Interlocking deadbolt operated by key from outside and by turn from inside. Specify regular or reverse bevel strike. Grade 1 has automatic shutter, which protects the lock mechanism in the event the cylinder is removed.

2.4.4.11 Combination Locks

Heavy-duty, mechanical combination lockset with five pushbuttons, standard-sized knobs, 20 mm deadlocking latch, 70 mm backset. Lock shall be operated by pressing two or more of the buttons in unison or individually in the proper sequence. Inside knob shall always operate the latch. Provide a keyed cylinder on the interior to permit setting the combination. [Provide a keyed [removable-core] cylinder on the exterior to permit bypassing the combination.] [Provide a thumb turn on the interior to activate passage set function, so that outside knob operates latch without using the combination.]

2.4.5 Exit Devices

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NOTE: Due to the difficulty in securing exit devices against unauthorized use, they should only be specified where required by D.M. 26.6.84 and Circular n. 91. Use single exit doors with locksets

in preference to pairs of doors. When pairs are required, specify removable mullions and rim type devices. Vertical rod devices require use of an overlapping astragal and door coordinator for security and fire protection. They should be used only where mullions are not feasible.

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Standard for exit devices in accordance with EN 179 and EN 1125. Provide adjustable strikes in accordance with PR EN 12209-2 and for rim type and vertical rod devices. Provide open back strikes for pairs of doors with mortise and vertical rod devices. [Touch bars [may] [shall] be provided in lieu of conventional crossbars and arms.] [Provide escutcheons, not less than 178 by 57 mm.]

2.4.5.1 Panic Exit Devices

Types:

a. Type 1: Rim exit device.

b. Type 2: Surface vertical rod exit device

c. Type 3: Mortise exit device.

d. Type 4: Narrow stile rim exit device.

e. Type 5: Narrow stile surface vertical rod exit device.

f. Type 6: Narrow stile concealed vertical rod exit device.

g. Type 7: Wood door concealed vertical rod exit device.

h. Type 8: Metal door concealed vertical rod exit device.

i. Type 9: Combination rim and surface vertical rod exit device.

j. Type 10: Narrow stile mortise exit device.

Functions:

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NOTE: All Functions are not available in all types of exit devices. Consult manufacturers catalog.

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FUNCTION	DESCRIPTION
a. 01:	Exit only, no trim.
b. 02:	Entrance by trim when actuating bar is locked down.
c. 03:	Entrance by trim when latch bolt is retracted by key. Key removable only when locked.

d. 04: Entrance by trim when latch bolt is retracted by key or set in a retracted position by key.

e. 05: Entrance by thumbpiece. Key locks or unlocks thumbpiece.

f. 06: Entrance by thumbpiece only when released by key. Key removable only when locked

g. 07: Entrance by thumbpiece. Inside key locks or unlocks thumbpiece. Outside key retracts latch.

h. 08: Entrance by knob or lever. Key locks or unlocks knob.

i. 09: Entrance by knob or lever only when released by key. Key removable only when locked.

j. 10: Entrance by knob or lever. Inside key locks or unlocks knob. Outside key retracts latch.

k. 11: Entrance by control turn piece. Key locks or unlocks control.

l. 12: Entrance by control turn piece only when released by turning key. Key removable only when locked.

Panic Exit Devices shall be operated from the inside at all times by a horizontal operating bar; bolts shall be regularly furnished with a key-operated dog to hold the latchbolt retracted for daytime use. Provide a carry bar for this type of installation. When the operating bar is pushed for exit, only two parts move: the bar itself and the latchbolt. Pressure on the operating bar is applied directly to the bolt. Cylinder operation is specified by inserting the number of pin-tumblers into the panic device nomenclature. Finish of Panic Exit Devices shall be [Satin Bronze] [Satin Chrome] [Satin Aluminum]. Provide hold-open device where required.

2.4.6 Exit Locks with Alarm

Standard for auxiliary locks & associated products, in accordance with EN 1125 (with full-width horizontal actuating bar) for single doors; (with actuating bar) (with actuating bar and top and bottom bolts, both leaves active) for pairs of doors, unless otherwise specified. [Provide terminals for connection to remote indicating panel.] [Provide outside control key.]

2.4.7 Cylinders and Cores

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NOTE: Obtain requirements for cylinders and cores from the Station Locksmith before editing the following paragraphs. Select the paragraph of parts of each paragraph below to meet Station requirements.
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Provide cylinders and cores in accordance with EN 1303 and UNI 9570. [Provide cylinders and cores for new locks, including locks provided under

other sections of this specification.] Cylinders and cores shall have [four] [five] [six] pin tumblers and utilize the same classification code requirements as the lockset specified. [Rim cylinders, mortise cylinders, and knobs of bored locksets shall have interchangeable cores which are removable by special control keys.]

[Cylinders shall have interchangeable cores which are removable by a special control key, and shall be factory set using the keyway system in accordance with cylinder manufacturer. Submit a core code sheet with the cores. The cores shall be master keyed in one system for this project. Provide construction interchangeable cores.]

[Cylinders shall be interchangeable and fully compatible with products from [Corbin Co.,] [Best Lock Co.,] [CISA Co.,] [AGB S.p.A.,] [Ingersoll-Rand] or [_____]. Stamp each interchangeable core with a key control symbol in a concealed place on the core.]

2.4.8 Keying System

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NOTE: Do not require higher levels of master keying than necessary because each level decreases the security of the locks. Specify a construction system where necessary to ensure security after construction is complete.
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NOTE: When an extension of an existing system is required, the manufacturer's name and type of locks should be indicated.
****

Provide [a [great] [grand] master keying system.] [an extension of the existing keying system. Existing locks were manufactured by [_____] and [do not] have interchangeable cores.] The Contractor shall coordinate keying system requirements with the Officer In Charge of Construction and Activity lock smith. [Provide [a construction master keying system] [construction interchangeable cores].] [Provide key cabinet as specified.]

2.4.9 Lock Trim

****
NOTE: For facilities which have not been certified as accessible only to able-bodied personnel, specify lever handles for doors which will be accessible to handicapped persons and knurled or abrasive coated knobs and lever handles for doors which are accessible to blind persons and which lead to dangerous areas.
****

Cast, forged, or heavy wrought construction and commercial plain design.

2.4.9.1 Knobs and Roses

****

NOTE: Refer to pr En 1906: For high frequency use, utilize Grade 4. For medium frequency use, utilize Grade 3. For light frequency use, utilize Grade 2.

The six digit code classification is described by the following:

1st character = Category of use

grade 4 [grade 3] [grade 2]

2nd character = Type of operation

[Type U] [Type A] [Type S]

3rd character = Safety

grade 0 [grade 1]

4th character = Security

grade 1 [grade 2] [grade 3]

5th character = Fire resistance

[grade 0] [grade 1]

6th character = Corrosion resistance

The corrosion resistance grades are defined according to EN 1670. [grade 0] [grade 1] [grade 2] [grade 3] [grade 4]

****

In addition to meeting test requirements of UNI 9171, UNI 9172 and PR EN 1906, knobs, roses, and escutcheons shell, shall be 1.25 mm thick if unreinforced. If reinforced, outer shall be 0.89 mm thick and combined thickness shall be 1.78 mm, except knob shanks shall be 1.52 mm thick. Knobs and roses shall be classified as [____] according to the 6 digit code classification described in PR EN 1906.

2.4.9.2 Lever Handles

Provide lever handles in lieu of knobs [where specified in paragraph entitled "Hardware Schedule"]. Lever handles for exit devices shall meet the test requirements of PR EN 1906 and EN 179 for mortise locks. Lever handles shall be classified according to PR EN 1906 six digit code classification described in paragraph entitled "Knobs and Roses". Lever handle locks shall have a breakaway feature (such as a weakened spindle or a shear key) to prevent irreparable damage to the lock when a force in excess of that specified in PR EN 1906 and EN 179 is applied to the lever

handle. Lever handles shall return to within 13 mm of the door face.

2.4.9.3 Texture

Provide knurled or abrasive coated knobs or lever handles [where specified in paragraph entitled "Hardware Schedule"] [for doors that are accessible to blind persons and which lead to dangerous areas].

2.4.10 Keys

Furnish one file key, one duplicate key, and one working key for each key change [and for each master [and grand master] keying system]. Furnish one additional working key for each lock of each keyed-alike group. [Furnish two additional keys for each sleeping room.] [Furnish [[_____] great grand master keys,] [[_____] construction master keys,] [and [_____] control keys for removable cores].] [Furnish a quantity of key blanks equal to 20 percent of the total number of file keys.] Stamp each key with appropriate key control symbol and "U.S. property - Do not duplicate." Do not place room number on keys.

2.4.11 Door Bolts

****

NOTE: Use chain and foot bolts for exceptionally high doors and where use of flush bolts is impracticable.

****

Door bolts shall be in accordance with PR EN 12051. Provide dustproof strikes for bottom bolts, except for doors having metal thresholds.

2.4.12 Closer

****

NOTE: Use closers in accordance with door and hardware manufacturer. Specify holder arms, where doors must be held open from 90 degrees to 135 degrees, or to 180 degrees where desired. Do not use holder arms for fire-rated doors. Use overhead concealed closers on main entrance doors of monumental buildings, double-acting doors, and for other openings where concealment is necessary. Avoid overhead concealed closers with wood doors. Where they can not be avoided, modify section on wood doors to require a 125 mm headrail. Avoid use of floor-concealed closers, but where required, ascertain that floor slab design will not interfere with closer case. In the paragraph below, include the bracketed statement for durability of door coordinator when automatic swing door operators are required. Exterior door coordinators shall be Grade 4 corrosion resistance. [Interior fire rated door coordinator shall be no less than Grade 2 corrosion resistance.] [Coordinator for automatic swing door

operators shall be Grade 8 durability.]
****

Double doors shall be provided with closer coordinators in accordance with EN 1154 and EN 1158. Provide with brackets, arms, mounting devices, fasteners, [full size covers, except at storefront mounting,] [pivots,] [cement cases,] and other features necessary for the particular application. Size closers in accordance with manufacturer's recommendations.

2.4.12.1 Floor Closers

[The load capacity of floor closers shall be based on the proportion between the door width [850], [1000], [1100], [1200], [1300] mm; angular position, and the weight of the door [80], [100], [120], [170], [210] kg.].

Floor closers shall be concealed in the floor as recommended by the manufacturer, for door size and location. Door closers shall be offset and single acting with positive stop at (90 /105) with/without hold open and shall allow no overswing.

a. Door closers shall be equipped with compression springs, cam and roller operating mechanism and a one piece spindle-cam for maximum operating performance and longevity. 'Full' closer size [128 x 155 mm] [310 x 107 mm].

b. Floor closer cover plate: [satin stainless steel] [satin brass].

[c. Hold open devices for floor closers shall be used whenever a door is required to be kept open continuously.]

2.4.12.2 Overhead Closers

All Overhead door closers shall have non-ferrous, full covers, forged steel arms, separate valves for adjusting backcheck [type PT4-D], [or delayed action type PT4-F where needed for the function of the opening] closing and latching cycles and adjustable spring to provide up to 50 percent increase in spring power. Closers shall be furnished with parallel arm mounted on all doors opening into corridors or other public places and shall be mounted to permit 180 degree door swing wherever wall conditions permit. [Furnish with non-hold open arms unless otherwise indicated.]

a. Overhead door closers cylinders shall be of high strength cast iron construction to provide low wear operating capabilities of internal parts throughout the life of the installation. All overhead door closers shall be tested to and have a written certification showing successful completion of a minimum of 10,000,000 cycles.

b. Overhead door closers shall utilize temperature stable fluid capable of withstanding temperatures ranges from 48 degrees Celsius to 0 degrees Celsius, without requiring seasonal adjustment of closer speed to properly close the door.

c. Overhead door closers shall incorporate tamper resistant non-critical screw valves of V-slot design to reduce possible clogging from particles within the closer. Closers shall have separate and independent screw valve adjustments for latch speed, general speed, and hydraulic backcheck. Backcheck shall be located so as to effectively slow the swing of the door at a minimum of 10 degrees in advance of the dead stop location to protect the door frame and hardware from damage.

d. Overhead door closers shall be warranted against failure due to defective materials and workmanship. Manufacturer's warranty shall be for a period of ten years commencing on the Date of Substantial Completion. In the event of failure, promptly repair or replace the defective products at no additional cost to the Government.

[e. Overhead door closers shall allow no overswing, with or without hold-open devices.]

[f. Parallel arm mounting for overhead closers shall be used where a minimum projection is required.]

[g. Hinge side mounting for overhead closers shall be used whenever the closer is required to be concealed to the greatest extent possible.]

2.4.12.3 Identification Marking

Engrave each closer with manufacturer's name or trademark, date of manufacture, and manufacturer's size designation located to be visible after installation.

2.4.13 Overhead Stop/Hold Open

Overhead surface mounted rod holder with hold open and release by push and pull of door, unless roller cam is set in inactive position; with stop and shock absorber; adjustable spring tension; for single acting doors opening 110 degrees.

2.4.14 Closer Holder-Release Devices

****

NOTE: For fire doors which must be held open, use electromagnetic holder-release devices in accordance with UNI 9723.

****

[UNI 9723.] [Single-point] [Multiple-point], [electro-magnetic] [electro-mechanical] release device, [wall] [floor] [door] mounted appliance that releases door from an open position for simultaneous closing upon signal from a smoke detector or other source. [Housing for floor mounted units shall be water resistant.]

2.4.14 Door Protection Plates

****

NOTE: Use pulls attached to plates. Use 200 by 400 mm push plates where door design permits. Use push bars or push and pull bars on all-glass doors. Use kick plates for push sides of doors equipped with closers. Use armor plates on heavy-duty doors where hand trucks or other heavy objects passing through the door could cause damage.

****

Materials: Fabricate protection plates from the following:

[a. Aluminum (UNI EN 485/3): 1.3 mm thick; beveled top and 2 sides.]

[b. Brass (EN ISO 6509): 1.3 mm thick; beveled top and 2 sides.]

[c. Bronze: 1.3 mm thick; beveled top and 2 sides.]

[d. Stainless Steel (EN 10051): 1.3 mm thick; beveled top and 2 sides.]

[e. Plastic Laminate: 3.2 mm thick; beveled 4 sides.]

[f. Rigid Plastic (ISO 6603-2): 1.5 mm thick, PVC or acrylic-modified vinyl plastic; beveled 4 sides.]

[g. Acrylic: 3.2 mm thick; beveled 4 sides.]

2.4.15.1 Sizes of [Armor] [Mop] [and] Kick Plates

****

NOTE: D.M. 26.6.84: Fire Resistance Classification and Ratification for Fire Prevention requires that door plates be not more than 400 mm high. Where wheelchair traffic is anticipated, kick plates should be 400 mm high.

****

Width for single doors shall be 50 mm less than door width; width for pairs of doors shall be 25 mm less than door width. Height of kick plates shall be [[200] [250] mm for flush doors] [and] [25 mm less than height of bottom rail for panel doors]. Height of armor plates shall be [not less than [900] [1200] [_____] mm for flush doors [and] [shall completely cover lower panels of panel doors [, except that armor plates on fire doors shall be 400 mm high]]. [Height of mop plates shall be [100] [150] mm.]

2.4.16 Edge Guards

****

NOTE: Edge guards should be detailed on drawings; stipulate material, gauge, dimensions, etc. Use edge guards in addition to armor plates on heavy-duty doors where hand trucks or other heavy objects passing through could damage doors. They are not required at hinge stiles on doors equipped with "swing clear" hinges.

****

Stainless steel, of same material and height as armor plates. Apply to [hinge stile] [lock stile] [meeting stiles]. Provide mortise type trim for mortise locks and latches in a [angle] [cap] shape.

2.4.17 Wall Bumpers

Aluminum with rubber bumper,; 64 mm diameter, minimum 19 mm projection from wall, with backplate for concealed fastener installation; with convex bumper configuration.

2.4.17 Door Stops and Silencers

****
NOTE: Specify wall bumpers wherever practical, except where they would be mounted on stud walls or partitions. Use floor stops only where necessary to prevent doors from hitting towel bars or similar items, as they create stumbling hazards and interfere with floor cleaning equipment.
****

Provide three silencers for each single door, two for each pair as recommended by door and hardware manufacturer.

2.4.18 Padlocks

****
NOTE: See referenced specification for types, grades and options available.
****

PR EN 12320, Grade [____].

2.4.19 Thresholds

****
NOTE: Where vertical rod exit devices are used, and for other outswinging exterior doors, in accordance with EN 1125.
****

[Fluted surface] [smooth surface] [aluminum] [brass or bronze] [_____] Threshold shall be as recommended by door and hardware manufacturer and with vinyl or silicone rubber insert in face of stop, for exterior doors opening out, unless indicated or specified otherwise. Provide exterior thresholds [with a positive waterstop] [smooth saddle shape] [_____] [as indicated]. All thresholds are required to be barrier free (13 mm) maximum height and corrosion resistant, EN 1670 grade 3.

2.4.20 Weather Stripping

****
NOTE: Weather stripping is also specified in

Section 08110, "Steel Doors and Frames," Section 08120, "Aluminum Doors and Frames," and Section 08210, "Wood Doors." Coordinate requirements to avoid conflict and duplication. Do not use interlocking type or spring tension type on metal doors and frames.

****

****

NOTE: Maximum air leakage rates are 2.19 x 10-5 cms per sq m of door area for residential swinging doors and 5.48 x 10-5 cms per sq m of door area for non-residential swinging doors.

****

PR EN 12365-1. A set shall include head and jamb seals[, sweep strips,] [and, for pairs of doors, astragals]. The classification of a typical interior weatherstripping for a door includes a working range of 5 mm, closing force within 20 Nm, working temperature range 0°C to +45°C, a minimum deflection of 70%, and a minimum long term recovery of 70%.

2.4.20.1 Extruded Aluminum Retainers

Extruded aluminum retainers not less than 1.25 mm wall thickness with vinyl, neoprene, silicone rubber, or polyurethane inserts. Aluminum shall be [clear (natural)] [bronze] anodized.

2.4.21 [Lightproofing] [and] [Soundproofing]

A set shall include adjustable doorstops at head and jambs and an automatic door bottom, both of extruded aluminum, [clear (natural)] [bronze] anodized, surface applied, with vinyl fin seals between plunger and housing. Doorstops shall have solid neoprene tube, silicone rubber, or closed-cell sponge gasket. Door bottoms shall have adjustable operating rod and silicone rubber or closed-cell sponge neoprene gasket. Doorstops shall be mitered at corners.

2.4.22 Rain Drips

Extruded aluminum, not less than 2.03 mm thick, [clear (natural)] [bronze] anodized. Set drips in sealant conforming to Section 07920, "Joint Sealants," and fasten with stainless steel screws.

2.4.22.1 Door Rain Drips

Extruded aluminum with [clear (natural)] [bronze] finish. Approximately 38 mm high by 16 mm projection. Align bottom with bottom edge of door.

2.4.22.2 Overhead Rain Drips

Extruded aluminum with [clear (natural)] [bronze] finish. Approximately 38 mm high by 64 mm projection, with length equal to overall width of door frame. Align bottom with door frame rabbet.

2.4.23 Special Tools

Provide special tools, such as spanner and socket wrenches and dogging keys, required to service and adjust hardware items.

2.4 FASTENERS

Provide fasteners of proper type, quality, size, quantity, and finish with hardware. Fasteners exposed to weather shall be of nonferrous metal or stainless steel. Provide fasteners of type necessary to accomplish a permanent installation.

2.5 FINISHES

****

NOTE: Choose one of the following options. Choose the first option for new buildings. Choose the second option only where necessary to match the finish on existing hardware.

****

[Hardware shall have EN 10088/1 polished satin stainless steel finish, unless specified otherwise. EN 1670 grade [2][3][4]. Provide items not manufactured in polished stainless steel, in satin chromium plated finish over clear-coated brass or bronze, except surface door closers which shall have [aluminum paint] [prime coat] [satin chromium plated] finish, and except steel hinges which shall have [satin chromium plated finish] [primed for painting finish]. Hinges for exterior doors shall be satin finished stainless steel or chromium plated brass or bronze. Wrought steel hinges shall be factory primed. Exit devices may be provided in satin chromium plated finish in lieu of satin stainless steel finish [except where satin stainless steel is specified under paragraph entitled "Hardware Sets"]. Exposed parts of concealed closers shall have finish to match lock and door trim. Hardware for aluminum doors shall be finished to match the doors.]

[Hardware shall have [polished brass] [polished stainless steel] [bright chromium bronze plated] [satin bronze finish] unless specified otherwise. Surface door closers shall have [bronze paint] [prime coat] [satin bronze] finish. Steel hinges shall have [satin bronze plated] [primed for painting] [____] finish. Exposed parts of concealed closers shall have finish to match lock and door trim. Hardware for aluminum doors shall be finished to match the doors. Hardware showing on interior of [bathrooms] [shower rooms] [toilet rooms] [washrooms] [laundry rooms] [and] [kitchens] shall have bright stainless steel finish or bright chromium plate] [clear coat brass and bronze] finish.

2.6 KEY CABINET AND CONTROL SYSTEM

****

NOTE: Key cabinets hold keys on panels. Systems include materials and devices for recording and cross-referencing data on use and location of locks and keys.

****

[[Wall mounted] type required to yield a capacity (number of hooks) 50 percent greater than the number of key changes used for door locks.]

PART 3 EXECUTION

3.1 INSTALLATION

Install hardware in accordance with manufacturers' printed instructions. Fasten hardware to wood surfaces with full-threaded wood screws or sheet metal screws. Provide machine screws set in expansion shields for fastening hardware to solid concrete and masonry surfaces. Provide toggle bolts where required for fastening to hollow core construction. Provide through bolts where necessary for satisfactory installation.

3.1.1 Weather Stripping Installation

Handle and install weather stripping so as to prevent damage. Provide full contact, weather-tight seals. Doors shall operate without binding.

3.1.1.1 Stop-Applied Weather Stripping

Fasten in place with color-matched sheet metal screws not more than 225 mm o.c. after doors and frames have been finish painted.

3.1.2 [Lightproofing] [and] [Soundproofing] Installation

Install as specified for stop-applied weather stripping.

3.1.3 Threshold Installation

Extend thresholds the full width of the opening and notch end for jamb stops with miter returns at open ends. Set thresholds in a full bed of sealant and anchor to floor with cadmium-plated, countersunk, steel screws [in expansion sleeves].

3.2 FIRE DOORS AND EXIT DOORS

Install hardware in accordance with D.M. 26.6.84, Circ. n. 91, EN 1125 and EN 179 for fire doors, [and] for exit doors [, and swinging tin-clad fire doors].

3.3 HARDWARE LOCATIONS

Unless indicated or specified otherwise:

a. Kick and Armor Plates: Push side of single-acting doors. Both sides of double-acting doors.

b. Mop Plates: Bottom flush with bottom of door.

3.4 KEY CABINET AND CONTROL SYSTEM

Locate where [directed] [indicated]. Tag one set of file keys and one set

of duplicate keys. Place other keys in appropriately marked envelopes, or tag each key. Furnish complete instructions for setup and use of key control system. On tags and envelopes, indicate door and room numbers or master or grand master key.

3.5 FIELD QUALITY CONTROL

After installation, protect hardware from paint, stains, blemishes, and other damage until acceptance of work. Submit notice of testing 15 days before scheduled, so that testing can be witnessed by the Contracting Officer. Adjust hinges, locks, latches, bolts, holders, closers, and other items to operate properly. Perform operational tests on all installed door hardware to demonstrate smooth, snag-free operation of all components. Demonstrate that permanent keys operate respective locks, and give keys to the Contracting Officer. Correct, repair, and finish, as directed, errors in cutting and fitting and damage to adjoining work.

3.6 HARDWARE SETS

****

NOTE: All of the following hardware items are described in accordance with the referenced European Norms:

Hinges and Pivots (PR EN 1935)

Single-axis pivot whose axis of rotation is within 30 mm of an edge of a movable element, either side or top fixing, and style. Hinges are classified according to the following eight digit coding system:

1. Hinge Grade (first digit) only use the following of the 14 grades:

Grade	Cycles	Mass (kg)
4	200,000	20
7	200,000	40
10	200,000	60
11	200,000	80
12	200,000	100
13	200,000	120
14	200,00	160

2. Category of Duty (second digit) only use one of the three duty levels listed below:

Category	Duty	Shear (kn)	Mass (kg)
2	Medium	1.5	60
3	Heavy	3.0	160
4A	Severe	6.0	160
4B	Severe	10.0	160
4C	Severe	15.0	160

Categories 1 and 1A (light) not listed.

3. Number of Test Cycles (third digit) only use the following Grades:

Grade	Cycles
4	200,000
7	200,000
10	200,000
11	200,000
12	200,000
13	200,000
14	200,000

Grades 3, 6 & 9 are tested for 25,000 cycles.

4. Door Mass/Size (fourth digit) use only the following of the eight grades:

Grade	Mass/Size (kg)
4	20
7	40
10	60
11	80
12	100
13	120
14	160

5. Corrosion Resistance Grade (fifth digit).

Grade	Level of Resistance
0	No defined level of resistance
1	Mild
2	Moderate
3	High
4	Very high

6. Safety (sixth digit).

Grade	
1	All hinges are required to be safe.

7. Fire Resistance (seventh digit).

Grade	Resistance
0	Not suitable for fire/smoke assemblies
1	Suitable for fire/smoke door assemblies

8. Burglary Resistance (eight digit).

Grade	Resistance
0	Not suitable
1	suitable

Locksets (PR EN 12209-1 and PR EN 12209-2)

The European Standard specifies requirements and test methods for strength, security, durability and function of mechanically operated lock and latch cases for use in door, window doors and entrance doors in buildings.

Exit Devices (EN 1125, EN 179)

The European Standards specify requirement for the manufacture, performance and testing of panic devices mechanically operated by either a horizontal push-bar or a horizontal touch bar specifically designed for use in panic situation. Use the following nine digit coding system:

1. Category Use (first digit).

Grade	Use
3	High frequency of use

2. Durability (second digit).

Grade	Cycles
6	100,000
7	200,000

3. Door Mass (third digit).

Grade	Mass (kg)
5	Up to 100
6	Up to 200

4. Fire Resistance (fourth digit).

Grade	Resistance
0	Not suitable
1	Suitable

5. Safety (fifth digit).

Grade	
1	All emergency devices have safety function

6. Corrosion Resistance (sixth digit).

Grade	Level
3	High resistance
4	Very high resistance

7. Security Grade (seventh digit).

Grade	Level
2	1000 N

8. Projection Category (eight digit).

Category	Projection (mm)
1	Up to 150
2	Up to 100

9. Type of Operation (ninth digit).

Type	Operation
A	Lever handle
B	Push pad

Padlocks (PR EN 12320)

The European Standard specifies performance requirements, test methods of strength, security and function of padlocks and padlock fittings used in building application. The classification is in six grades where grade 1 has the lowest requirement.

Closers (EN 1154)

Closers are classified according to the following six digit coding system:

1. Category (first digit).

Grade	Rotation
3	At least 105^0
4	180^0

2. Number of Cycles Test (second digit).

Grade	Cycles
8	500,000

3. Door Mass (third digit).

Size	Leaf width (mm)	Mass (kg)
1	<750	20
2	850	40
3	950	60
4	1100	80
5	1250	100
6	1400	120
7	1600	160

4. Fire Behavior (fourth digit).

Grade	Behavior
0	Not suitable
1	Suitable

5. Safety (fifth digit).

Grade
1 The only one identified

6. Corrosion Resistance (sixth digit).

Grade	Resistance
0	No defined resistance
1	Mild
2	Moderate
3	High
4	Very high

The European Standard specifies requirement for the manufacture, test methods of strength and minimum thicknesses.

Bolts (PR EN 12051)

The European Standard specifies requirement for the manufacture, test methods of strength and minimum thicknesses.

****
****

NOTE: Coordinate this section with Section 08120, "Aluminum Doors and Frames."

Either list hardware set numbers on the drawings or list doors by number in each hardware set. List hardware sets in the following format:

SAMPLE LIST OF HARDWARE SETS

QUANTITY	ITEM	CLASSIFICATION	TYPE	FUNCTION
EXTERIOR DOORS				
HW-1 (Door 1 and 2):				
1 1/2 Pair	Hinges	113741111	Stainless Steel	
2 Each	Closer	483113	Overhead parallel arm mounting (PT4-D)	
2 Each	Kickplates	----	As specified	
2 Each	Pull Handles	----	As selected from Manufacturer Standards	
1 Each	Exit Devices/ Push Bars	37601321B ----	Type A Function (EO) Bright Brass	

	Threshold	----	As specified
	Weatherstrip	----	As specified

HW-2 (Door 3 and 4):

1 1/2 Pair	Hinges	113741111	Stainless Steel	
1 Each	Closer	483113	Overhead parallel arm mounting.(PT4-D)	
1 Each	Lockset	3334-13	Mortise type (Abrasive finish at exterior)	(F07)
1	Threshold	----	As specified	
1	Weatherstrip	----	As specified	

QUANTITY	ITEM	CLASSIFICATION	TYPE	FUNCTION

HW-3 (Doors 5, 6, and 7, each pair):

3 Pair	Hinges	113741111	Stainless steel	
1 Each	Lockset	3334-13	Stainless steel	(F82)
1 Each	Flush bolt	----	(Concealed, Inactive Leaf)	
1 Each	Dustproof Strike	----	Manufacturer Standard	
2 Each	Closers	483113	Overhead parallel arm mounting (PT4-F)	
1 Each	Coordinator	----	Manufacturer's Standard	
1 Each	Threshold	----	As specified	
1 Each	Weatherstrip	----	As specified	

HW-4 (Door 8) Screen Wall Gate:

1 Each	Padlock	----		

INTERIOR DOORS

HW-5 (Door 9, 10 and 11):

1 1/2 Pair	Hinges	113741111	Steel hinge	
1 Each	Closers	483113	Overhead parallel arm mounting (PT4-D)	
1 Each	Lockset	3332-03	Mortise type	(F07)
1 Each	Doorstop	----	Manufacturer's standard	
1 Each	Kickplate	----	As specified	
1 Each	Threshold	----	As specified	

HW-6 (Door 12, 13 and 14):

1-1/2 Pair	Hinges	113741111	Stainless steel	
1 Each	Push plate	----	Manufacturer's standard	
1 Each	Pull	----	Manufacturer's standard	
1 Each	Closers	483113	Overhead parallel	

			arm mounting (PT4-D)	
1 Each	Stop	----	Manufacturer's standard	

HW-7 (Door 15, 16 and 17):

1-1/2 Pair	Hinges	113741111	Stainless steel	
1 Each	Closer	483113	Overhead parallel arm mounting (PT4-D)	
1 Each	Lockset	3332-03	Mortise type	(F07)
1 Each	Doorstop	----	Manufacturer's Standard	
1 Each	Kickplate	----	As specified	

****

[Hardware for aluminum doors shall be provided under this section. Deliver Hardware templates and hardware, except field-applied hardware to the aluminum door and frame manufacturer for use in fabricating the doors and frames.]

-- End of Section --